

young in science as Japan. This was the proffer by Sakurai's chemical colleagues of a number of original papers, some ready and others nearing completion, to be published together as a festschrift number of the *Journal of the College of Science* in honour of the event. Together they form nearly half of vol. xxv. of the journal, the rest of the volume, it is of interest to state, consisting of a botanical paper in Latin by B. Hayata, entitled "*Flora Montana Formosæ*," and illustrated by forty-one exquisite plates. Prefixed to the copies of the chemical part of the volume which have been issued separately for presentation purposes is a biographical sketch of Sakurai, by Prof. N. Matsui, director of the College of Agriculture.

The contents of this publication are ample evidence of the striking and wonderful success, in the course of relatively few years, of Japan's venture into the field of chemical research. There are seventeen papers, touching nearly all parts of present chemical investigation, all of them of value as original contributions, some of very considerable value, and most of them fixing the attention. In abstract they are now appearing, or have already appeared, in European journals; any one of them would have been accepted for publication here or in Germany (two are in German). One was partly published at the time of the jubilee in the *B. d. deutschen chem. Gesellschaft*.

"The Viscosity of Dilute Alcoholic Solutions," by T. Hirata; "Die Anomalie der starkeneinwertigen Electrolyte," by M. Katayama; and "Coagulation of Colloidal Aluminium Hydroxide by Electrolytes," by S. Kawamura, are three examples of excellent work. Two other papers, "The Fusion Curves of the System, Naphthalene-phenol," and "The Fusion Surfaces of the System, Naphthalene-chlorobenzene-phenol," the post-graduate work of two of Prof. K. Ikeda's pupils, T. Yamamoto and H. Hirose, are also of high excellence. The paper by Prof. Ikeda himself, on "The Chemical Theory of Solutions," part i., which covers eighty quarto pages, is particularly worthy of attention. It is, in fact, a short treatise which, when part ii. can be added to it, should have publication in book form, so valuable does it appear to be. It is an exceptionally clear exposition of the subject in admirable English, showing marked originality of treatment, fully illustrated by curves, and mathematically discussed, altogether a most interesting paper.

"The Inversion of Cane-sugar," by Y. Osaka; "Complex Ferri-malonates," by M. Matsui; "Constitution of Elæomargaric Acid," by T. Kametaka; "Japanese Oils," by the same; "Ueber den Hauptbestandteil des japanischen Lacks," by Majima and Cho; "Oximes and Imides of Benzenedisulphonic Acids," by T. Suzuki; "Formation of *p*-Oxycarbostyryl from *o*-Nitrobenzoylacetic Acid," by K. Matsubara; and "Molecular Re-arrangement of N-Benzylbenzal-oxime," by M. Kuhara, are also interesting contributions.

There is a paper by, like Prof. Kuhara, another well-known chemist, Prof. T. Haga, entitled "A Simple Method of preparing the Imides of the Aromatic Sulphonic Acids," which is a perfect little piece of work of its kind, admirably written. There are still to be noticed two papers by Prof. M. Ogawa which, from their subjects, will be of greater general interest than any other member of this group of Japanese papers, for they seem to establish the existence of two new elements among the metals, *nipponium*, and another not yet named. These papers recently appeared in full in the *Chemical News*. Mr. Ogawa was, two or three years ago, in London, working upon the new mineral, *thorianite*, placed in his hands by Sir William Ramsay. Some

of this mineral he took back with him to Japan, where he has discovered other mineral sources of both these elements.

Besides the contents of Sakurai's jubilee part of the *Journal of the Tokyo College of Science*, other important chemical papers have, from time to time, appeared in that journal, and in English and German journals. But the appearance of this budget of papers on chemical research offers itself now as a striking proof of the remarkable progress which has taken place in the pursuit of chemistry by a nation which, thirty years ago, was nearly ignorant of any significant part of it. That in physics and in the biological sciences the Japanese have equally advanced under similar conditions is, of course, familiar to many of the readers of NATURE.

EDWARD DIVERS.

THE AGEING OF STEEL.

A MEMORANDUM, by Mr. C. E. Stromeier, the chief engineer of the Manchester Steam Users' Association, just issued, deals with the important question of the ageing of steel, especially that used for steam-boilers. It is now twenty-five years since mild steel began to come into use for boilers, and some definite conclusions have been reached as to its behaviour with time. Tensile and bending tests of steel, cut from boiler plates which have been in use for many years, show that the tenacity has remained practically unaltered, while the ductility, as measured by the elongation, has not been affected. It is known that even the best Lowmoor iron boiler plates become brittle with long-continued use, and it is important to know if this happens with steel plates, but no very definite conclusions appear to have been reached, although it was found that the effect of an injury, such as a chisel nick, or a serious deforming pressure, is not an immediate one, except as regards local alteration of shape, but that after the lapse of many weeks the neighbourhood of the injured region gets somewhat brittle.

A very complete account is also given of the causes which produce water-hammer in steam pipes, and the pressures reached in various cases are worked out in some detail, showing very conclusively the superiority of mild steel over cast iron for steam pipes, not only on account of its superior tenacity, but also by reason of its capacity to absorb sudden shock by its elastic and plastic deformation.

NOTES.

WE notice with sincere regret the announcement in the daily papers that Lord Rayleigh, who, accompanied by Lady Rayleigh, left England recently for a tour round the world, has been so ill in South Africa that he has abandoned a proposed visit to Australia, and will probably winter in Egypt. Later reports state that, though his lordship has been seriously ill, he is now much better.

THE one-hundredth anniversary of the birth of Charles Darwin will occur on Friday of next week, February 12. To celebrate this event the New York Academy of Sciences will hold a special meeting on the anniversary day at the American Museum of Natural History. We learn from *Science* that in addition to the presentation to the museum of a bust of Darwin—the presentation to be made by Mr. Charles F. Cox, president of the academy, and the acceptance by Dr. Henry F. Osborn, president of the museum—addresses will be given on Darwin's work in botany, by Prof. N. L. Britton; on Darwin's work in zoology, by Prof. H. C. Bumpus; and on Darwin's work in geology, by Prof. J. J. Stevenson.

WE regret to see the announcement that Mr. W. H. Hudleston, F.R.S., past-president of the Geological Society, died on January 29 at eighty years of age.

PROF. LOUIS MANGIN has been elected a member of the Paris Academy of Sciences, for the section of botany, in succession to M. Van Tieghem, who was elected permanent secretary recently.

DR. ALEXANDER W. PAVLOW, privat-docent in geology in the University of Moscow, has been elected foreign secretary of the Imperial Society of Naturalists of Moscow, and Prof. E. Leyst the curator of the scientific collections of the society.

REUTER correspondents report the occurrence of the following earthquakes during the past few days:—*January 27, Messina.*—A strong shock of earthquake, preceded by rumblings and lasting three seconds, was felt at 8 a.m. *February 1, Montreal.*—Three distinct earthquake shocks were experienced early this morning, but no serious damage was done.

A REUTER message from Khartum states that Prof. Sayce has discovered the true site of the ancient city of Meroë, about three miles from Kabushia station, near Shendi, which is half-way between Khartum and Atbara. Due west of the Pyramids, near Kabushia, he found on January 16 the great wall of the inner defences and the remains of the Temple of Ammon mentioned in Strabo; also part of the Avenue of Rams, leading up to the temple, and a statue of a king, life size, besides scarabs, seals, pottery, &c., which date from B.C. 700 to A.D. 300.

M. HENRI POINCARÉ was officially received into the French Academy on January 28, succeeding to the place vacated by the late Sully Prudhomme, the poet. An eloquent eulogy on M. Poincaré was pronounced by M. Frédéric Masson, the historian, who, professing ignorance of M. Poincaré's great work in physics, mathematics, and astronomy, proceeded to give an appreciative estimate of Poincaré, the man, accentuating the promise of his boyhood and youth which has been so abundantly realised during manhood.

At the general monthly meeting of the Royal Institution on February 1, the treasurer announced that the sum of 10,000*l.* has been anonymously and unconditionally placed by a lady at the disposal of the managers for the purposes of the institution. A resolution was passed expressing grateful appreciation of the donor's munificence and discernment, and accepting the gift as a timely and noble recognition of the good public works the institution has done in the past, and is still doing, in the acquisition and diffusion of scientific knowledge, and as an incitement to maintain and extend its usefulness in the unique position which it has occupied for more than a century.

WE learn from the *British Medical Journal* that the French Congress of Scientific Societies will be held this year at Rennes. Among the subjects proposed for discussion are:—the relations of sociology and anthropology; alcoholism—the evil, its causes and remedies; tuberculosis and the means of avoiding contagion; high altitude and seaside sanatoriums; methods and disinfection against contagious diseases, and the results obtained in towns, rural districts, and establishments in which disinfection is practised; the water supply of towns—the contamination of subterranean lakes; leprosy and pellagra in France; the part played by insects, and especially the common fly, in the dissemination of contagious diseases; hygiene of the school child.

A CONVENTION which will include all branches of medical electricity will be held in London on July 5–9 at University College. The exhibition will include all classes of electrical and physical apparatus for medical treatment. It will be held contemporaneously with the convention, and it is hoped that it will give a stimulus to the manufacture of X-ray and other apparatus. Delegates will be present from America and the Continent, and representatives of the various foreign Governments will be invited to take part in a discussion as to the best means of providing apparatus and training for the Army and Navy. The papers and debates will be in English. Papers in French and German will be accepted provided a *résumé* of such papers is sent in English. All papers will be reported either *in extenso* or in abstract in the Archives of the Röntgen Ray. Communications referring to the congress should be addressed to Mr. Ernest Schofield, organising secretary of the X-Ray Convention, 11 Chandos Street, Cavendish Square, London, W.

A SPECIAL point of view of the new Patent Law was referred to by Prof. G. H. Bryan, F.R.S., in a letter to the *Standard* of January 14. Prof. Bryan says the new Act "means that British labour is to be employed in exploiting the brains of German professors subsidised by the German Government, and that the position of the English brain-worker is to be even worse than it has been in the past. There are hundreds of scientific workers in this country who would be only too glad to make and develop discoveries that would bring English industry up to the same high level that has been reached in Germany. Unfortunately, however, their only chance of employment lies in teaching students to pass examinations for salaries often considerably below a living wage, when not one out of a hundred of these candidates will be either competent or in a position to develop any new discovery." While sympathising with Prof. Bryan's plea for increased opportunities for research by men competent and anxious to undertake it, we think he overlooks the probability that British capitalists will learn through the new Act the value of scientific work in promoting industrial developments. The German manufactories introduced into this country as a consequence of the Act should be a striking object-lesson of the connection between scientific research and industrial progress.

At the first International Congress of Refrigerating Industries, held in Paris last October, the proceedings at which were described in *NATURE* of October 22 last (vol. lxxviii., p. 644), it was decided to hold the next congress in 1910 at Vienna, and to form an international association, which would give participating countries opportunities of continuing the work begun last year. A meeting was held in Paris on January 25, when delegates were present from thirty-nine countries other than France, with a view to sanction statutes prepared by a specially appointed committee. Some discussion took place as to the seat of the international association, which one of the statutes submitted fixed at Paris. Eventually, according to the *Times* Paris correspondent, all delegates, with the exception of those from Germany and Austria, approved the statutes. Meanwhile, the Germans and Austrians are to consult their Governments, and it is still likely that unanimity may be secured. In the contrary event, the question of holding the second congress at Vienna in 1910 will require some reconsideration.

THE summary of the weather for the week ending January 30, issued by the Meteorological Office, shows that a touch of real winter was experienced during the

period. Over England the mean temperature for the week was from 7° to 9° below the average, and in all the English districts the sheltered thermometers fell below 20° . In the south-west of England and in the Midland counties the lowest temperature was 13° , whilst at Llangammarch Wells the temperature on the grass was 2° . The week was everywhere very dry, and, indeed, the rainfall for the whole of January was much below the average over the whole of England. In London the aggregate rainfall for the month was 0.7 inch, which is less than one-half of the average. At Bath the total measurement was 1.02 inches, which is 1.56 inches less than the average, and at Portland Bill the measurement for the month was only 0.73 inch, which is 1.58 inches less than the normal. At Valencia the deficiency of rain for the month was 2.64 inches. In parts of Scotland the rainfall was in excess of the average. There was a deficiency of sunshine in Ireland during January, but in other parts of the British Isles there was generally an excess.

A REPORT issued by the honorary secretaries of the Aërial League of the British Empire states that the league is making good progress. So soon as possible it is hoped to circulate an official journal and establish a school or college of aeronautics. Arrangements are being made for lectures to be given in all important centres of population in order to interest the public in aërial flight. The purpose of the league is to secure and maintain for the Empire the same supremacy in the air as it now enjoys on the sea; to disseminate knowledge, and spread information, showing the vital importance to the British Empire of aërial supremacy; and to urge these matters upon the nation and upon public bodies and public men throughout the Empire by constitutional means. The league will not favour any one type of airship or any industrial interest. We are in sympathy with the desire expressed in the report that the British nation may take an honourable share in the development of means of aërial navigation. We trust it will be recognised fully by the executive officers of the new league that there is little hope of success of a lasting kind unless the methods of science are adopted from the beginning. The hearty and active cooperation of those men of science who have studied the questions connected with the problem of aërial flight should be obtained at the outset, and their knowledge must be used in determining the forms of activity of the league if national progress in aeronautics is to be secured.

THE record of a trip through the Vedda country of Ceylon, by C. G. and B. Z. Seligmann, forms the subject of the opening and longest article in the number of *Spolia Zeylanica* for December, 1908. Some difficulty was at first experienced in ascertaining whether any pure-bred, cave-dwelling Veddans remain, but, after encountering some half-bred tribes, who dressed (or rather undressed) for the part when the arrival of visitors was signalled, the travellers were finally successful in meeting with the objects of their search, several of whom were interviewed. It is less satisfactory to be informed that the numbers of such folk now appear to be comparatively small. Good descriptions are given of the caves these tribes inhabit. Very curious is the discovery that certain beads worn by some local tribes, by whom they are regarded as semi-sanct, are of Venetian manufacture, and date from the sixteenth or seventeenth century.

THE second number of the Memoirs of the National Museum, Melbourne, is devoted to a monograph, by Mr. F. Chapman, of the Silurian bivalved molluscs of Victoria. Eighteen per cent. of the collection has been identified

with species found in other, and frequently widely sundered, areas, the distribution of these ranging in Great Britain through the Wenlock and Ludlow groups, although the German forms occur in the Lower and Middle Devonian. The American types are found in their own home mainly in the Middle Devonian, although one belongs to the upper division of that period. "From this," observes the author, "the inference may be drawn, that since both in Western Europe and Australia the species made their first appearance in the Upper Silurian, the point of dispersal would probably be situated mid-way between those places, provided the conditions were equal, and that there were no barriers to their migration."

THE zoological portion of the imposing building in Singapore known as the Raffles Museum is in the main devoted to the Malay fauna, of the representatives of which a very extensive series of specimens appears to be displayed in the public galleries. To illustrate and explain this collection, the authorities of the museum have just published a guide-book, drawn up by Dr. R. Hanitsch, the director, which is entitled to take high rank among works of this nature. It is, in fact, a concise and popular compendium of the leading elements of the Malay fauna, and ought, therefore, to be of considerable interest to naturalists generally, as well as to the class for which it is primarily intended. The guide is illustrated by twenty-one plates, reproduced from photographs mainly taken by two local gentlemen. While a few of these are devoted to the building itself, the great majority depict the specimens in the collection; these serve to show that in the classes of mammals and birds the series boasts some very fair examples of modern taxidermy, among the most striking being the groups of anthropoid apes and Carnivora.

Now that attention is centred on Slav politics, the essay by Mr. F. P. Marchant on the Slavonic languages, which appears in No. 53 of the Journal of the Anglo-Russian Literary Society, is certainly timely. It discusses the relationship of the languages spoken by the race, which is divided into an eastern and a western division, the former including Russians (Great, Little, and White), Bulgarians, and Serbo-Croats; the latter Poles, Cecks, Moravians, and Lusatian Wends. The writer, while discussing the inter-relation of these forms of speech, denies that the so-called Palæo-Slavonic is, as has been assumed by some writers, the mother tongue. Another difficulty is the absence of a common syllabary, which can hardly be met by the adoption of the Russian (Cyrillic) alphabet for the whole group. There is a certain but limited degree of affinity between the various subdialects. A Russian scholar in Warsaw or Prague will understand shop-signs and street directions provided he knows the compounds of Latin letters representing certain consonants, and he may occasionally catch the drift of the conversation of persons passing him in the streets. Cecks are sometimes able to understand Russian, but Russians seem generally to fail to understand them. In short, proficiency in one Slavonic tongue does not, we are told, lead to the mastery of others, and the theory held by some Russian students that they know all about other Slav languages is said to be a patent fallacy. It is obvious that this difficulty of intercommunication is a decided bar to that political combination which is now so often suggested. It is much to be regretted that the limited facilities of intercourse between the Slav countries and western Europe have so long prevented the valuable scientific and literary work of these races from gaining the recognition which it deserves. It

may be hoped that our recent political rapprochement with Russia will lead to more study of this important linguistic group, in which much useful work has been done by those scholars whose achievements are recorded by Mr. Marchant.

In connection with heliotropic sensibility, Dr. P. Fröschel contributes to the *Sitzungsberichte der kaiserlichen Akademie der Wissenschaft*, Vienna (vol. cxvii., part ii.), an account of a preliminary experiment to ascertain the presentation period, i.e. the shortest time for which a light stimulus must be applied to produce a reaction. The presentation period naturally depends upon the intensity of the light. The author finds that the curve expressing the ratio of the intensity to the presentation period takes the form of a rectangular hyperbola. Working with cress seedlings, a discernible curvature was induced in so short a time as two seconds by a light of 200 candle-power.

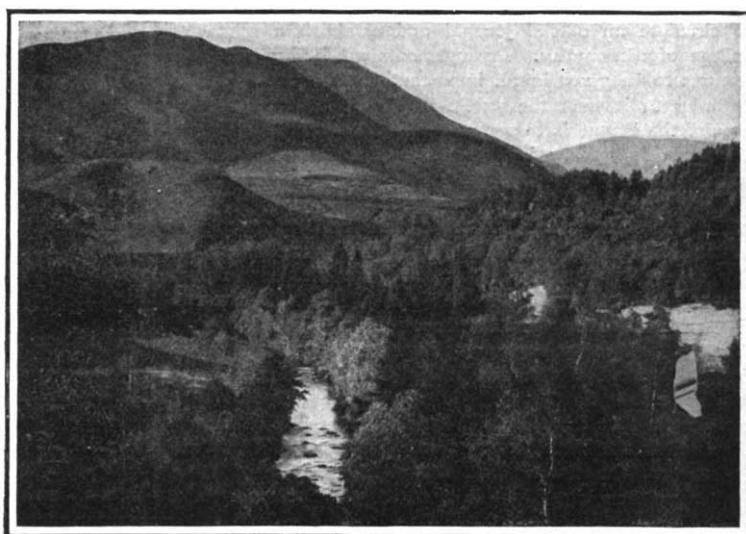
A NOTE on the manufacture of ngai camphor from the composite shrub *Blumea balsamifera* is contributed by Mr. P. Singh to the Indian Forest Records (vol. i., part iii.). This variety of camphor is manufactured by the Chinese, and receives from them its designation "ngai." The investigation was prompted by the abundance in certain forest lands of the species noted and *Blumea lacera*, another species emitting a camphoraceous odour. Ngai camphor would not provide a substitute for the ordinary camphor derived from *Cinnamomum camphora*, but has a high value of its own, because the Chinese use it as a medicine and for ritualistic purposes, also in the preparation of fine qualities of Chinese ink.

THE new catalogue of microscopes and accessories published by Messrs. W. Watson and Sons, High Holborn, gives full details of their extensive series of microscopes, ranging from the "Van Heurck Grand Model," supplied with various ingenious devices for regulation, to simple types, low-priced but of guaranteed workmanship, suitable for schools. A new model, the "Standard," is announced, in which the fine adjustment is fixed to the side of the limb instead of at the back; also a new portable instrument, that folds up for packing, has been designed. Owing to the success of the new 1/6-inch semi-apochromatic objective with a large working distance, a 1/12-inch oil-immersion objective has been computed on similar lines. The museum exhibition microscope and the Porro erecting prism for dissecting work are ingenious novelties.

In a third part of his studies in root-parasitism, published in the botanical series (vol. ii., No. 5) of the Memoirs of the Department of Agriculture in India, Mr. C. A. Barber deals with the haustoria of *Cansjera Rheedii*. Compared with the types *Santalum album* and *Olex scandens* already described, *Cansjera* resembles the former, whence the suggestion arises that the genus should be truly assigned to the Santalaceæ. The small, irregular haustoria are supplied with numerous lenticels and covered with warty excrescences, while the corky tissue forms a characteristic white sheath. Internally the haustorium consists of cortical cells, from which the contents pass

towards the seat of activity, a transitional region where vascular tissue is formed, and a central core, the source of the penetrating and glandular tissue. For the various points of detail in connection with the method of penetration, the development of an endodermis, and other features the reader must refer to the original.

THE fifth part of the fourth volume of the Transactions of the Perthshire Society of Natural Science (1908) contains a number of reproductions from photographs illustrating Mr. H. Coates's presidential address on the glaciation of the county. One of these pictures is here given. The activity of the society extends beyond Perthshire, and the Rev. G. Knight writes on the natural history, geology, and antiquities of Duror, Argyllshire, from the mollusca of Loch Linnhe, through "kentallenite," to Allan Breck Stewart, "a soldier of fortune, a spendthrift, and a prodigal." Mr. G. F. Bates describes the igneous rocks of Glen Lednock, the picturesque valley opening north from Comrie; the successive points in the landscape will be pleasantly recognised by those who have passed over



View looking up the Sma' Glen from its mouth, showing mounds of fluvio-glacial deposits. Photo. by Mr. A. S. Reid, reproduced in Macnair's "Scenery and Geology of the Grampians."

by this route to Loch Tay. Though the paper professedly deals with microscopic details, it is really an account of an excursion, and from this point of view we should like to learn more of the inter-relations of the rocks, especially at their margins, in the field. In an area like this there can be no real distinction between igneous and metamorphic gabbro, such as the author implies on p. 233. Dr. Shand describes crystals of grossularite from Corsiehill Quarry, including a new hexakisoctahedral form. Dr. Lyell directs the attention of members to the mycetozoa to be found near Perth.

In the *Cairo Scientific Journal* for November, 1908, Captain H. G. Lyons states that the Nile flood of that year was one of especial interest; the height reached by the river and the volume discharged were above the average for the first time since 1898, although the level was a good deal below the highest recorded at Aswan during the last forty years. This result was due to heavy rainfall in Abyssinia in July, September, and the early part of October. Captain Lyons considers that one of the most promising lines of attack upon the problem of the

Abyssinian rains and the Nile flood is the investigation of the upper air in the monsoon region of the Sudan, whereby the velocity and direction of the air currents at different levels may be determined. The results of observations hitherto made by means of pilot balloons are now being prepared for publication, and will probably show in what direction further efforts should be made. The problem "concerns not Egypt alone, but all countries which depend upon the rainfall of the monsoon winds which flow from the Indian Ocean."

THE Humber Conservancy has recently been making experiments with a buoy for lighting the channel of the river in place of the gas buoys or vessels now in use. This buoy has been placed at the disposal of the Conservancy by the International Marine Signal Company. It consists of a generator tube containing carbide, which is floated in a flotation chamber 8 feet in diameter. The gas is generated by the water entering the lower end of the generator and attacking the carbide. This causes a slight gas pressure, which forces the water away from the carbide, stopping the further generation until the gas is used in the lantern, when the water rises again and more gas is made. There is no moving mechanism in the buoy, which draws about 9 feet; the focal plane is 9 feet above water-level. The light is of 340 candle-power, and can be seen at a distance of more than a mile. It shows a flash of about five seconds, and a dark period of four seconds.

OF the many screen-plate processes of colour photography on a single plate that have been proposed and worked at since the Lumière firm, of Lyons, produced their autochrome plate, a very short time ago there was only one, the "Thames" plate, that had reached the commercial stage. We learn from the *Times* that another, the "Omnicolore" of Messrs. Jougla, is now on the French market. We believe that this plate has compound lines, alternating green and red, separated from each other by narrower violet lines. By the use of transparent colours, much more light may be transmitted than in the case of the starch-grain screen of the autochrome plate, with a corresponding gain in brilliancy and shortness of exposure. The new plate has aroused much attention on the Continent, and experimentalists in this country are looking forward to its introduction here.

THE December (1908) number of *Ion*, a *Journal of Electronics, Atomistics, Ionology, Radio-activity, and Raumchemistry*, contains six articles and reviews of seven books. The whole of the articles, of which two deal with applications of the electron theory to the properties of the elements, appear to have been translated from the German by persons unacquainted with the English scientific equivalent of many common expressions. Thus we read about "balls of electricity," "a negative charge unit," "spherical plane," "Peltiere-" and "Halle-effects," "eutechticum," &c. Print and paper are good, and the diagrams show a great improvement on those in the November number.

In the December (1908) number of the *Physical Review* there is an abstract of a paper communicated by Mr. W. P. Boynton to the New York meeting of the American Physical Society in October, on the specific heats of gases. In it the author emphasises the following as a more rational method of treating the subject than is to be found in the standard text-books. If the specific heat of a gas at constant volume be multiplied by the molecular weight we get a quantity we may call the molecular heat. The fraction of this which is due to the translational motion

of the molecule is equal to $3/2(\gamma-1)$, where γ is the ratio of the two specific heats of the gas. The product of the molecular heat by this fraction may be called the "translational molecular energy," and ought, according to the kinetic theory of gases, to be a constant for all gases. For forty monatomic and polyatomic gases and vapours considered by Mr. Boynton, it differs from 3 by less than 3 per cent. in forty-five cases.

MESSRS. TOWNSON AND MERCER have sent us their new double condenser. We have tried this apparatus, and find it a very efficient condenser. It has two double tubes inside the condensing cylinder. The vapour to be condensed is split up into two streams, and passes through two narrow tubes, consequently there is very efficient cooling. The apparatus contains two of these tubes, with two separate inlets and outlets, consequently two distillations can be carried out at the same time with one piece of apparatus. Also two reflux operations can be conducted at the same time. This, however, can only be done if the flasks are of very small size, because otherwise the necks will be too far apart for the tubes to fit in. As a double condenser for distilling two products at once the apparatus is fairly convenient; but for carrying out two reflux operations at once it is not of great use, first, because the flasks must be small, and, secondly, owing to the rigidity of the apparatus. The condenser was designed by Mr. W. H. Rawles.

BULLETIN No. 68 of the New Mexico College of Agriculture contains a well-illustrated account of the injurious insects commonly occurring in the region served by the college, with methods for destroying them and for protecting crops against their attack. The instructions are clear and to the point; the bulletin affords a very good example of the work done for farmers by the American colleges.

THE current number of the *Journal of Economic Biology* contains an account, by Mr. Graham, of certain hitherto undescribed insect pests affecting cocoa in West Africa. One damages the trees by perforating the bark, and so produces "gumming." Another burrows between the bark and the wood of the branches, arresting the flow of the sap; it has caused a great amount of damage in cocoa plantations of South Ashanti. The cultivation of cocoa has only recently been introduced in this district; the weevil seems originally to have infested the indigenous Papaw tree.

THE first number of a new monthly technical magazine has appeared under the title *Leather: Technical and Practical*. It appeals specially to all workers engaged in the leather industries, is edited by Mr. M. C. Lamb, and published by the Leather Trades Publishing Co., 143 Holborn Bars, London, E.C. The dependence of technical processes upon the principles of science is recognised fully, as the titles of some of the articles sufficiently show. Prof. H. R. Procter writes on some unsolved problems in leather chemistry, Mr. S. A. Gaunt gives an account of chrome liquors and their application, and Mr. J. L. van Gijn provides notes on liming of hides for sole leather.

PARTS iii. and iv. of vol. xi., and part i. of vol. xii., of "The Proceedings and Transactions of the Nova Scotian Institute of Science, Halifax, Nova Scotia," have been received. The three books deal respectively with the sessions 1904-5, 1905-6, and 1906-7, but have only just reached us. Containing as the books do full and original papers on the geology, botany, and zoology of Nova Scotia by local observers, in addition to researches in chemistry and physics conducted at Dalhousie University, Halifax,

they serve as a convenient record of scientific activity in Nova Scotia. The earliest volume contains an interesting paper, by Dr. A. H. MacKay, on phenological observations in Nova Scotia and Canada during 1904, from which it appears that more than 300 accurate and full schedules of observations were sent in from as many public schools in Nova Scotia, and were referred in groups to a phenological staff for examination, selection, and compilation. This utilisation of the energy of young students of science throughout the province is a hopeful sign for the future of scientific research in that part of the Empire. The same number contains a full account of the edible wild plants of Nova Scotia by Mr. Walter H. Prest, and several papers on the geology of different areas in the province. During the session 1905-6, the flora of McNab's Island, Halifax Harbour, was described by Dr. John H. Barbour, and a catalogue of the birds of Prince Edward Island prepared by Mr. John MacSwain. The fungi of Nova Scotia are being studied by Dr. A. H. MacKay, and a first supplementary list appears in the first part of vol. xii.; which also contains notes on the mineral fuels of Canada, by Dr. R. W. Ellis. Mr. H. Jermain M. Creighton, of Dalhousie University, contributes numerous papers to these Transactions, among which we notice that on the influence of radium on the decomposition of hydriodic acid.

FROM the Carnegie Institution of Washington, Washington, D.C., we have received a useful pamphlet giving the titles, descriptions, authors' names, &c., of the publications of the institution. The editions of each work are generally restricted to 1000 copies, and bound in cloth, and the prices quoted in the present list refer to the cloth-bound works. The different works treat of a wide range of subjects, among which astronomy, biology, and physics are well represented. All communications respecting these works should be addressed to the institution as above.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN FEBRUARY:—

- Feb. 6. 22h. 12m. Jupiter in conjunction with Moon (Jupiter $3^{\circ} 53' S.$).
12. Saturn. Major axis of Ring = $38''.18$, minor axis = $4''.49$.
- „ 10h. 54m. Minimum of Algol (β Persei).
15. 7h. 43m. Minimum of Algol (β Persei).
- „ 8h. 43m. Mars in conjunction with Moon (Mars $0^{\circ} 1' N.$).
- „ Apparent diameter of Mars = $5''.4$, Jupiter = $41''.0$, Saturn = $15''.2$.
19. 9h. 49m. to 13h. 9m. Transit of Jupiter's Satellite III. (Ganymede).
22. 7h. 29m. Saturn in conjunction with Moon (Saturn $2^{\circ} 52' N.$).
24. 14h. 42m. to 18h. 36m. Transit of Jupiter's Satellite IV. (Callisto).
26. 13h. 5m. to 16h. 26m. Transit of Jupiter's Satellite III. (Ganymede).
27. 6h. 47m. to 7h. 31m. Occultation of 105 Tauri (mag. 5.8).
- „ 12h. 42m. to 13h. 31m. Occultation of η Tauri (mag. 5.2).

JUPITER'S EIGHTH MOON.—A telegram from Greenwich, published in No. 4299 of the *Astronomische Nachrichten* (p. 47, January 22), announces that Jupiter's eighth satellite was photographed there on January 16. From two photographs it was found that the daily motion was $-16s.$, $+1'$, and that the magnitude of the satellite was 17.0. The position determined from these photographs is in close accordance with the Cowell-Crommelin elements.

THE PROBLEM OF SEVERAL BODIES.—In an address delivered before Section A—Astronomy and Mathematics—

of the American Association for the Advancement of Science, Baltimore, 1908, the chairman of the section, Prof. E. O. Lovett, gave a valuable *résumé* of the recent progress made in the solution of the problem of several bodies. An abstract of this address now appears in *Science* (No. 733, p. 81, N.S., vol. xxix.).

Commencing with Whittaker's formulation of the classic problem of three bodies, Prof. Lovett proceeds to enumerate, very briefly but very clearly, the results of various attempts to obtain particular solutions and their generalisations. The paper is too comprehensive even to summarise here, but some idea of the thorough treatment the subject receives may be gathered from the fact that it refers to no fewer than ninety-three workers who have contributed to the solution of the problem, and in each case gives sufficient information to enable the reader to see which particular part of the subject each worker attacked.

AN ECCENTRIC VARIABLE STAR.—In No. 4299 of the *Astronomische Nachrichten* (p. 47, January 22) Miss Mary W. Whitney directs attention to the unusual variations lately exhibited by the variable SS Cygni. Since October 3, 1908, the star has varied almost continuously, although irregularly, and at minimum has not fallen to its usual limit; the lowest minimum recorded was about mag. 10.8, the highest mag. 10.5. The maxima, too, have differed from those usually looked for, the brightest being mag. 8.9. The light curves, though irregular, have been rather of the anomalous than of the usual type.

THE MINOR PLANET PATROCLUS (617).—A bi-daily ephemeris for the minor planet Patroclus, of the Jupiter group, is continued by Herr V. Heinrich in No. 4299 of the *Astronomische Nachrichten* (p. 45). This ephemeris extends from January 4 (opposition took place on January 6) to March 19, and the probable magnitude is given as 12.9.

An observation made by Prof. Wolf on January 9 gives a correction of $-0m. 39s.$, $+3'.3$, to the ephemeris position, and shows that the photographic magnitude is less than 13.0.

DETERMINATION OF THE APEX AND VERTEX FROM THE STARS IN THE PORTER CATALOGUE.—From an analysis of the proper motions of the 1340 stars given in the Porter catalogue, Herr S. Beljawsky has obtained values for the positions of the apex and vertex respectively, which he publishes in No. 4291 of the *Astronomische Nachrichten*. The analysis was made by dividing the catalogue stars into thirty regions, and the final values obtained are:—apex, $A=281^{\circ}$, $D=+36^{\circ}$; vertex, $A=266^{\circ}$, $D=-24^{\circ}$.

COLOURS OF STARS IN GALACTIC AND NON-GALACTIC REGIONS.—Continuing his investigations of the relationships existing between star colours, spectral class, magnitude, &c., Mr. Franks made an analysis of the colours and magnitudes of 3630 stars, given in the Revised Harvard Photometry, between the north pole and declination $25^{\circ} S.$

As a result of this analysis he finds that the distribution of white and of coloured stars is not symmetrical; there is a striking preponderance of white stars in the galactic, as compared with the non-galactic, regions.

Mr. Franks interprets this result as showing an undoubted physical connection between the colours of stars and the galaxy, and suggests that the latter is probably the newest and most vigorous part of the stellar universe (Monthly Notices, R.A.S., vol. lxi., No. 2, p. 106, December, 1908).

POPULAR ASTRONOMY.—Evidence of the increased interest taken in astronomy by the general public is to be found in the fact that several daily papers now devote space to astronomical news.

From this point of view it is interesting to note that the *Daily Telegraph* of January 27 contained a map of the February sky, with notes on the objects which may be observed; this article is the first of a monthly series. We also remark that the *Yorkshire Weekly Post* is publishing a series of articles by Mr. J. H. Elgie, who in a recent issue directed attention to the possibility of a connection between solar activity and earthquake phenomena.